UNIVERSITY OF JAMMU

(NAAC ACCREDITED 'A' GRADE' UNIVERSITY)
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

Academic Section
Email: academicsectionju14@gmail.com

NOTIFICATION
(23/May/Adp./39)

In Continuation to this office notification No. F.Acd./II/22/5382-5425 dated:18.09.2022, it is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Competent Authority, is pleased to authorize the Changes in the **Scheme of Examinations** in the Syllabi and Courses of Studies of subject of **Botany** of Semester **Ist and IInd** for **Four Year Under Graduate Programme (FYUGP)** under the **Choice Based Credit System** as per **NEP-2020 (as given in the annexure)** for the examinations to be held in the years as per the details given below:

Subject	Semester	Course Code	For the examinations to be held in the year
Botany	Semester-I	USEBOT-104 (Skill Enhancement Course)	December 2022, 2023 and 2024
	Semester-II	USEBOT-104 (Skill Enhancement Course)	May 2023, 2024 and 2025

The Syllabi of the courses is available on the University website: www.jammuuniversity.in

Sd/-
DEAN ACADEMIC AFFAIRS

No. F. Acd/II/23/3530-3540
Dated: 26-5-2023
Copy for information and necessary action to:

1. Dean, Faculty of Science
2. Convener, Board of Studies in **Botany**
3. Sr. P.A.to the Controller of Examinations
4. All members of the Board of Studies
5. Confidential Assistant to the Controller of Examinations
6. I/C Director, Computer Centre, University of Jammu
7. Deputy Registrar/Asst. Registrar (Conf. /Exams. UG/Eval Non-Prof)
8. Incharge, University Website for Uploading of the notification.

Sumitra Arora 25/5
Deputy Registrar (Academic)

25/5/23 24/5 24/5/23

UNIVERSITY OF JAMMU
Syllabus for FYUG Program in
BOTANY (under CBCS as per NEP–2020)
UG SEMESTER–I
(For the examinations to be held in the years December 2022, 2023, 2024)

NURSERY AND GARDENING
(SKILL ENHANCEMENT COURSE)

Course No. USEBOT104

Max. Marks: 50

	Credits	Contact Hours	Units	Examination			
				Duration (hours)		Weightage (Marks)	
				Mid semester	End semester	Mid semester	End semester
Theory & Practical	02	30	I to III	01	2½	10	40

Objectives:

The course aims to make students understand the theoretical and practical details of nursery and gardening. Knowledge so gained will provide them with the means for their self-employment and also of others.

Learning outcomes:

The students will be able to distinguish and choose the plant species amenable for nursery and gardening. They can develop their own nursery for livelihood and marketing purposes. The course will also equip the students with the basic skill needed to design and lay gardens.

Unit-I: Introduction to Nursery and Gardening

1.1 Definition and types of nurseries; physical resources for nurseries.

1.2 Selection of nursery site, ecological conditions, important nursery operations.

1.3 Definition and components of gardens, types of gardening (landscape and home gardening).

1.4 Scope and objective of gardening; garden landscaping with specific reference to Kew Botanical garden, AJC Bose Indian Botanic Garden, Kolkata and Lal Bagh Botanical Garden, Bangalore.

Unit-II: Plant Propagation Methods

2.1 Seed dormancy – causes and methods of breaking it; seed germination, types and factors affecting it.

2.2 Vegetative propagation, artificial and natural methods; Concept of soilless cultivation withspecial reference to aeroponics and hydroponics.

UNIVERSITY OF JAMMU
Syllabus for FYUG Program in
BOTANY (under CBCS as per NEP–2020)
UG SEMESTER–I
(For the examinations to be held in the years December 2022, 2023, 2024)

NURSERY AND GARDENING
(SKILL ENHANCEMENT COURSE)

Course No. USEBOT104 **Max. Marks: 50**

2.3 Concept of micro-propagation, hardening, packaging, transport and marketing of nurseryplants; Scope and importance of plant propagation in nurseries.

2.4 Propagation structures: Mist chambers, green houses, glass houses, polyhouses and shadehouses.

Unit-III: Practicals

3.1 Equipments and implements used in nurseries and gardening.

3.2 Gardening operations – Soil structure, bed preparation, fertigation and irrigation.

3.3 Weed management, water management, drainage, trimming, pruning and thinning.

3.4 Sowing/ raising of seeds and seedlings; transplanting of seedlings.

3.5 Potting, repotting, depotting and mulching.

3.6 Demonstration of techniques of vegetative means of propagation.

3.7 Preparation of material for hydroponics and aeroponics.

3.8 Field trip to Botanical garden of University of Jammu and important locally available nurseries.

3.9 Demonstration of formation of vertical gardens.

Note for paper setters

End Semester University Examination (Total Marks: 40; syllabus to be covered: 100%)

The question paper will have 2 components of 20 marks each.

Component 1 based on Units I & II will have 2 sections. Section 'I' will be compulsory having four questions of 2½ marks each and spread over the entire theory syllabus (two from each unit i.e., Units I and II). The questions will be short answer type having answers not exceeding 30 to 60 words. Section 'II' will have four long answer type questions, two from each unit. Each question will be of 5 marks. The candidates will be required to answer one question from each unit.

Component 2 based on Unit III will be external practical examination of 15 marks and viva voce of 5 marks.

Mid Semester Assessment Test (Total Marks: 10; syllabus to be covered: up to 50%)

The question paper will have 2 components of 5 marks each.

Component 1 will consist of theory paper with ten (10) questions distributed as 5 MCQs, 3 fill in the blanks and 2 one word answer tpe questions. All the questions are compulsory and each question carries ½ mark.

Component 2 will consist of practicals and will comprise of attendance, practical test and daily performance based on practical work done.

UNIVERSITY OF JAMMU
Syllabus for FYUG Program in
BOTANY (under CBCS as per NEP–2020)
UG SEMESTER–I
(For the examinations to be held in the years December 2022, 2023, 2024)

NURSERY AND GARDENING
(SKILL ENHANCEMENT COURSE)

Course No. USEBOT104 **Max. Marks: 50**

Suggested readings

1. Acquaah, G. (2009). Horticulture, Principles and Practices (4th edition). Pearson Publisher, PrenticeHall.
2. Bose, T.K and Mukerjee, D. (1977). Gardening in India. New Delhi Oxford & IBH Pub. Co. Pvt. Ltd.
3. Bose, T.K., Singh, L.J., Sandhu, M.K. and Maity, T.K. (2015). Ornamental plants and Garden design in Tropics and Subtropics (Vol 1 & 2). Daya Publishing House; A division of Astral International Pvt. Ltd.
4. Brukell, C. (2007). Encyclopedia of Gardening. Dorling Kindersley Ltd.
5. Hartman, H.T. (1959). Plant Propagation–Principles and Practices by Prentice. Hall International: London.
6. Kumar, N. (2010). Introduction to Horticulture (7th edition). Oxford & IBH Publishing Company Pvt.Ltd.
7. Rao, M.B. (2005). Textbook of Horticulture (2nd edition). Macmillan India Ltd.

UNIVERSITY OF JAMMU
Syllabus for FYUG Program in
BOTANY (under CBCS as per NEP-2020)
UG SEMESTER–II
(For the examinations to be held in the years May 2023, 2024, 2025)

BIO FERTILIZERS
(SKILL ENHANCEMENT COURSE)

Course No. USEBOT204

Max. Marks: 50

	Credits	Contact Hours	Units	Examination			
				Duration (hours)		Weightage (Marks)	
				Mid semester	End semester	Mid semester	End semester
Theory & Practical	02	30	I to III	01	2½	10	40

Objectives:

The course introduces the students to the world of bio fertilizers which is quite relevant in the face of chemical fertilizers ruining the fertility of our agricultural fields. Bio fertilizers are harmless, replenish the soils and maintain their fertility over long periods of time. Therefore, a course on their types, preparation, and importance is the need of the hour.

Learning outcome:

The students will learn about different microbial sources of bio fertilizers. They will understand the role of nitrogen fixing organisms in soil fertility and will be practically trained to make Bio fertilizers. This in turn will enable them to start their own enterprise of a bio fertilizer brand.

Unit–I: Introduction to bio fertilizers

1.1 Bio fertilizers: definition, different sources, importance and comparison with conventional fertilizers.
1.2 Biological nitrogen fixation, symbiotic and asymbiotic.
1.3 General account of the microbes commonly used as bio fertilizers.
1.4 *Rhizobium*- infection and nodulation, isolation and mass multiplication.

Unit–II: Common bio fertilizers and nitrogen fixers

2.1 *Azospirillum* and *Azotobacter*: isolation, important characteristics and mass multiplication.
2.2 Manures: definition, types and their importance with special reference to green manure.
2.3 Cyanobacteria: cell structure, forms and characteristic features.
2.4 Heterocyst as a site of nitrogen fixation and importance of Nitrogenase; role of Cyanobacteria and *Azolla* in rice cultivation.

UNIVERSITY OF JAMMU
Syllabus for FYUG Program in
BOTANY (under CBCS as per NEP-2020)
UG SEMESTER–II
(For the examinations to be held in the years May 2023, 2024, 2025)

BIO FERTILIZERS
(SKILL ENHANCEMENT COURSE)

Course No. USEBOT204 **Max. Marks**

Unit–III: Practicals

3.1 Study the root system of leguminous plants.
3.2 Isolation of *Rhizobium* from root nodules of legumes.
3.3 Collection of Cyanobacteria and *Azolla* from rice fields.
3.4 Study of cell structure of Cyanobacteria.
3.5 Study the morphology of *Azolla*.
3.6 Isolation of *Anabaena* from coralloid roots of *Cycas*.
3.7 Study of heterocyst from *Anabaena* and *Nostoc*.
3.8 Demonstration of bio fertilizer preparation.
3.9 Preparation of farmyard manure (FMY).
3.10 Vermicompost preparation.

Note for paper setters

End Semester University Examination (Total Marks: 40; syllabus to be covered: 100%)

The question paper will have 2 components of 20 marks each.

Component 1 based on Units I & II will have 2 sections. Section 'I' will be compulsory having four questions of 2½ marks each and spread over the entire theory syllabus (two from each unit i.e., Units I and II). The questions will be short answer type having answers not exceeding 30 to 60 words. Section 'II' will have four long answer type questions, two from each unit. Each question will be of 5 marks. The candidates will be required to answer one question from each unit.

Component 2 based on Unit III will be external practical examination of 15 marks and viva voce of 5 marks.

Mid Semester Assessment Test (Total Marks: 10; syllabus to be covered: up to 50%)

The question paper will have 2 components of 5 marks each.

Component 1 will consist of theory paper with ten (10) questions distributed as 5 MCQs, 3 fill in the blanks and 2 one word answer tpe questions. All the questions are compulsory and each question carries ½ mark.

Component 2 will consist of practicals and will comprise of attendance, practical test and daily performance based on practical work done.

UNIVERSITY OF JAMMU
Syllabus for FYUG Program in
BOTANY (under CBCS as per NEP-2020)
UG SEMESTER–II
(For the examinations to be held in the years May 2023, 2024, 2025)

BIO FERTILIZERS
(SKILL ENHANCEMENT COURSE)

Course No. USEBOT204 **Max. Marks: 50**

Suggested Readings

1. Bartha, A. (1998). Microbial Ecology: Fundamentals and applications. Benjamin/ Cummings, (4th edition).
2. Bhojiya, A. A., Jain, D. and Joshi, A. (2019). Manual on Bio fertilizer Research (Laboratory to Commercial Production) Apex Publishing House.
3. Das, D.K. (2002). Introduction to Soil Science. Kalyani Publisher 3rd edition.
4. Diaz, L.F., Bertoldi, M. and de Bidlingmaier, W. (2007). Compost Science and Technology, Elsevier, New York.
5. Gaur, A.C. (1990). Phosphate Solubilities, Micro-organizms and Bio fertilizers.. Oxfordand IBH Publishing Co. New Delhi.
6. Kolay, A. K. (2007). Handbook of Manures and Fertilizers. Atlantic Publisher.
7. Mukerjee, N. and Ghosh, T.K. (1998). Agricultural Microbiology, Kalyani Publisher, NewDelhi.
8. Mukerjee, S.K. (2006). An Introduction to Soil Science. Tata Mc graw Hills ICAR.
9. NIIR Board (2012). The Complete Technology Book on Bio fertilizer andOrganic Farming (2nd Revised Edition). NIIR Project Consultancy Services.
10. Russel, E. (2010). Soil Conditions and Plant Growth, Nabu Press Publisher.
11. Sathe, T.V. (2004). Vermiculture and organic Farming. Daya Publishers.
12. Subbha Rao, W.S. (1982). Bio fertilizers in Agriculture and Forestry. Oxford and IBH Publishing Co., New Delhi.
13. Subha Rao, N.S. (2000). Soil Microbiology, Oxford & IBH Publishers, New Delhi.
14. Tandon, H.L.S. (1992). Fertilizers, Organic Manures, Recyclable Wastes and Biofertilizers. Fertilizer Development and Consultation Organization, New Delhi.
15. Tandon, H.L.S. (2011). Bio fertilizers and Organic Fertilizers. Fertilizer Development and Consultation Organization, New Delhi.
16. Tate, R.L. (2012). Soil Microbiology (Second edition). Wiley India Pvt Ltd; pp532.
17. Vayas,S.C, Vayas, S. and Modi, H.A. (1998). Bio-fertilizers and organic Farming Akta Prakashan, Nadiad
18. Yadav, A.N. (2021). Production Technology for Bio agents and Bio fertilizers-A Laboratory Manual. Eternal University, Himachal Pradesh.
19. Rai M.K. (2005). Handbook of Microbial Bio fertilizers. The Haworth Press Inc., New York.